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ABAC-APFF-IFC-SBF Hybrid Roundtable

Financing Sustainable Innovation in the Asia-Pacific Region

25 April 2023

Singapore Business Federation Building

ROUNDTABLE REPORT

Achieving the net zero goals to limit global warming to 1.5 degrees Celsius by 2050 will require a rapid reduction of carbon emissions, which at present remain at unsustainably high levels. This is especially the case in the energy sector, which accounts for the bulk of global CO2 emissions. The rapid growth of wind and solar energy and the market for electric cars demonstrates the potential of technology to reduce emissions. However, these technologies need to be deployed on a far greater scale, and applications of other clean energy solutions such as carbon capture, utilization and storage (CCUS), hydrogen, synthetic fuels and bioenergy will need to be significantly advanced beyond the current early stages of development.

Transitioning from the current situation, where coal, oil and natural gas still make up 70 percent of global final energy demand to one where clean energy solutions can assume this role will require faster and efficient innovation. Under this scenario, the International Energy Agency envisions low-carbon power (for fueling vehicles and providing heat to industry, homes and buildings) to contribute 35 percent to global de-carbonization; CCUS (for producing synthetic low-carbon fuels, removing CO2 from the atmosphere and producing low-carbon hydrogen) 25 percent; bioenergy 20 percent; and hydrogen (for extending electricity's reach to heavy industries such as steel production and fueling large ships) 5 percent.[1] In addition to innovations in technologies for developing commercially viable clean energy sources, innovations across industries such as steel, cement, chemicals, and the transport and building sectors for using them will be needed.

No less important will be the innovations in the use of digital technology, including Internet of Things (IoT), data integrity solutions (DIS), artificial intelligence (AI), machine learning (ML), low-energy distributed ledger technology (DLT),[2] cloud computing and cybersecurity solutions for the achievement of the net zero goals. Digital technology will be key to solving complex optimization challenges for smart, decentralized grids to enable the use of renewable energy for industries that require continuous round-the clock energy supply. DLT (including DIS implemented DLT) will enable fully traceable digitized supply chain and carbon emissions tracking to verify sustainability claims. IoT, advanced analytics and digital dashboards will allow energy end-users to obtain insights into their energy choices, consumption and usage patterns. Collection and analysis of data using sophisticated reporting, data science and audit tools will be important for governance and compliance. [3]

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[1] IEA, Energy Technology Perspectives 2020 [https://iea.blob.core.windows.net/assets/7f8aed40-89af-4348-be19-c8a67df0b9ea/Energy_Technology_Perspectives_2020_PDF.pdf]

[2] https://ledgernomic.com/hedera-hashgraph-named-the-most-energy-efficient-dlt-by-ucl/

[3] Digital technology: The backbone of a net-zero emissions future (MIT Technology Review) [https://www.technologyreview.com/2023/03/08/1069473/digital-technology-the-backbone-of-a-net-zero-emissions-future/]

These innovations will be important for lowering the costs and accelerating the transition toward a green future, especially for Asia-Pacific developing economies and for micro-, small and medium enterprises (MSMEs). For the region to accelerate innovations to achieve the net zero goals, economies need to develop enabling ecosystems for financing these innovations. This Roundtable sought to identify the key innovations needed in the region to achieve the net zero goals and the key elements of a Sustainable Innovation Financing Ecosystem. It also explored ways for APEC to provide a collaborative platform to support member economies in this process and identify concrete regional initiatives that can have significant tangible impact in stimulating the financing of innovations by both technology start-ups and established companies. An important consideration is that the incentive for innovators to participate in green technology development for commercialization is the assurance that innovations and inventions will be protected and financed. Intellectural property rights (IPR) transparency and commercial clarity is a key enabler for securing financing for commercialization.

The Landscape of Sustainable Innovation

> *Deployment of renewable energy has grown over the last decade thanks to innovations in technology and decreasing costs but this deployment is not on pace for meeting 2030 targets. Likewise, half of the emission reductions needed in 2050 require technologies that have not yet reached market, many of which are only in the early stages of development.*[4]

Much progress has been achieved over the past decade. The debate over climate change has been mostly resolved. Major advances in technology and their commercialization, particularly in the fields of electric vehicles and renewable energy sources, have been achieved. The financial industry is also responding to the challenge – assets that first were mainly focused on energy now cover wider sectors like green buildings, vehicles and transport, while products have expanded to various capital market instruments including bonds, funds and structured finance. Investments in digital technology that can be used in promoting the net zero goals have been growing. An important tipping point in decarbonization has been reached with the conversation now shifting toward concrete transition pathways.

Financial institutions are stepping up to commit to the net zero carbon emissions goals and together with investors, consumers, governments and regulators are exerting growing pressure on companies to significantly reduce their GHG emissions. The introduction of policies such as the Inflation Reduction Act (IRA) in the USA and the Carbon Border Adjustment Mechanism (CBAM) in the EU is adding to the pressure. All of these, however, will not be enough for the world to reach the 2050 net zero goal, given the current state of technology and pace of transition.

Reaching net-zero emissions will require more innovation to accelerate the pace and reduce the costs of transition. This involves the development of innovations that can be deployed in three areas:

- *Improving material efficiency* to minimize the need to produce energy-intensive materials (e.g., aluminium, cement, plastic, steel) using circular economy principles;
- *Reducing energy demand*, especially for GHG-emitting fuels through more efficient use of energy; and
- *Decarbonizing energy supply* through enabling greater reliance on renewables, hydrogen fuels and sustainable bio-fuels, in conjunction with CCUS and improved grid flexibility, reliability and resiliency.

[4] United Nations, Theme Report on Innovation, Technology and Data: Towards the Achievements of SDG 7 and Net-Zero Emissions, 2021 https://www.un.org/sites/un2.un.org/files/2021-twg_4-exesummarie-061721.pdf

Innovations will need to happen across interdependent climate technology "families" that play key roles in addressing GHG emissions:[5]

- *Agriculture and food*: Precision agriculture, crop preservation, regenerative technology, alternative proteins
- *Batteries/energy storage*: Electric vehicle batteries, long-duration energy storage, efficient recycling technologies
- *Building technologies*: Geothermal heating, heat pumps, electric equipment
- *CCUS*: Point-source carbon capture, direct air capture
- *Circular economy*: Battery recycling, chemical cellulosic recycling, heat recovery, plastics recycling
- *Hydrogen*: Electrolyzers, fuel cells, methane pyrolysis
- *Industrial process innovation*: Electrification of heat sources, green steel, green cement
- *Nature-based solutions*: Monitoring/verification for forests, peatlands, mangroves
- *Renewables*: Solar, onshore and offshore wind, grid innovation
- *Sustainable fuels*: Advanced bio-fuels, e-fuels

Two case studies illustrate the huge potential of new innovations to accelerate transition:

- *Electricity storage*: Form Energy developed a new class of technologies that enable longer-term storage of electricity, such as iron-air batteries that can store electricity for as long as 100 hours at system costs that are competitive with legacy power plants, and so can enable electric grids to continuously run on low-cost renewables. While this technology, which provides energy more cheaply than coal, has been successfully used in a developed economy environment, it faces challenges in developing economies related to the lack of incentives in government policy that would reward companies for reducing energy usage from fossil fuels.
- *Molten oxide electrolysis (MOE)*: Boston Metal developed a technology for one-step decarbonization using renewable-powered electricity in place of fossil fuel to produce green steel. It separates oxides at high temperatures, converting all iron ore grades into liquid metal and oxygen. Modular MOE cells (about the size of a school bus) that can be scaled up to millions of tons of output simply by adding new cells offer greater efficiency, lower costs and environmental sustainability across the steel value chain compared to traditional production methods and can be competitive even without a carbon tax.

Innovations in digital technology, which is already playing an important role in carbon emissions reduction, will also need to be accelerated. AI, DIS, big data and low-energy DLT, among others, are being used to enable electricity grids to be more flexible and integrate a greater share of renewable energy sources at lower costs. Digital technology is also enabling new business models that support last-mile energy access through such systems as pay-as-you-go model for solar energy. It has also enabled the wider adoption of autonomous vehicles and intelligent home systems.

Planning, monitoring trends, tracking progress toward policy goals and making evidence-based decisions require high-quality and reliable data and enabling digital technologies. In combination with remote sensing, digital technology enables cost-effective assessment of consumers' energy profiles and the generation of reliable statistics on energy production and demand. Privacy enhancing technologies (PETs) are important for aggregating and anonymizing data used in improving energy systems, understanding load profiles and reducing costs for household consumers. A key challenge is how to overcome the barriers

[5] Bernd Heid, Martin Linder and Mark Patel, *Delivering the climate technologies needed for net zero (McKinsey, April 2022)* https://www.mckinsey.com/capabilities/sustainability/our-insights/delivering-the-climate-technologies-needed-for-net-zero

to data access (e.g., for the purpose of green certification of projects) that arise from data protection and localization measures that are currently proliferating across the region.

The Artificial Intelligence of Things (AIoT) combining AI technologies with the Internet of things (IoT) infrastructure provides a case study on how digital technology is accelerating transition to net zero by simplifying the complex, time-consuming and error-prone process of quantifying, reducing and monitoring emissions and making it more efficient, transparent and effective. It does this by providing the digital foundation for monitoring, analytics, forecasting, optimization and trading.

- *Measuring*: AIoT enables end-to-end carbon footprint tracing by integrating into measurement and reporting the various data (e.g., emission data from meter readings, purchase records, utility bills, engineering models) that traditionally required laborious collection processes, difficult reviewing of carbon footprints and validating assumptions about emissions.
- *Abatement*: It helps plan and track progress toward decarbonization by creating insights from real-time DIS data for better predicting process emissions. This addresses the uncertainty and complexity of the traditional process of identifying key sources of emissions and implementing measures to reduce them due to the involvement of multiple variables, as well as the laborious tracking of performance and progress of abatement programs.
- *Carbon offsetting and offset integration*: It provides a one-stop access to a multitude of carbon credits and renewable energy certificates (RECs) marketplace by supporting the validation of RECs in near real-time and offering a marketplace for affordable and fast carbon offsetting. This address challenges related to accurate measurement, transparency, verification and ease of trade.

Financial innovations at the early stage are also needed for the development of new technologies, particularly through collaboration among governments, the private sector and multilateral financing institutions. Through blended finance, governments, MFIs and other donors can crowd-in commercial capital to fund projects that contribute to sustainable development. This will involve the combination of instruments such as guarantees and subsidies from government, first-loss financing from MFIs, [6] foundation and charitable organization grants, investments and loans from ESG and impact investors, securitization, green and transition finance bonds and loans, currency risk instruments, disaster risk insurance schemes, carbon markets and climate crediting mechanisms and environmental trust funds, among others. These innovations in finance are particularly critical in addressing the challenges faced by lenders and investors in financing new technologies. These include the inherent uncertainties about technologies and their viability, scientific uncertainties (e.g., whether biofuels should be financed), and the responsiveness of policies to investor needs and the risks they face.

Blended finance is particularly important for many developing economies in the region, where governments typically face serious constraints in providing subsidies and where there is a greater need for innovations to enable early retirement and decommissioning of relatively new coal plants and accelerate transition of hard-to-abate sectors. In these economies, the need to achieve just and affordable transition is also acute, including the reskilling of a large part of the labor force engaged in fossil fuel and high GHG-emitting industries through vocational training and new educational programs in engineering, law, accounting and finance. While blended finance has been effective in promoting funding for mature technologies, its potential for facilitating innovations still needs to be developed.

The need for innovation is urgent. Given the long investment cycle for hard-to-abate sectors such as cement, plastics and steel, the alignment of innovation timelines with the 2050 net zero targets needs to

[6] An example is the IFC's work with foundations and charities to reduce costs of financing for the development of new technologies.

be completed soon, if the risk of locked-in emissions from investing in existing technologies or incremental innovations is to be avoided. This, however, also poses a dilemma. Current scenarios for achieving the 2050 target are mostly based on the ability to very rapidly deploy and scale up proven technologies such as wind, solar and electrification. While technologies in early stages of development may have greater potential to accelerate the pace and lower the costs of transition to net zero, delaying the deployment of proven technologies in the hope of bringing these newer technologies to maturity and scale in time carries its own risks and uncertainties, including the risks of ending up with higher abatement costs.

Innovation can enable the Asia-Pacific region fully harness its potential for sustainable development, given its abundant supply of solar, wind and hydro energy sources, biofuel and minerals. At the same time, the need for sustainable investment in the region, especially in its developing economies, is huge. Major progress has been achieved in the development of electric vehicles within the region, but in many markets there is a need to remove uncertainties that hinder investment in sustainable innovation. Economies will need to address these obstacles and develop enabling ecosystems that can attract firms, investors, financial institutions and venture capital to promote innovations that can fully harness the region's resources and eventually enable APEC to take the lead in globally promoting sustainable innovation.

Creating an Enabling Sustainable Innovation Financing Ecosystem

Innovation is a dynamic process involving complex and interconnected systems, multiple actors and institutions, including government and regulators, the private sector, research and academia, civil society and end users. Beyond the focus on achieving breakthroughs in technology, it requires a holistic approach that embraces systems thinking and considers entire value chains, enabling innovations in policy and planning, finance and business models that need to be enabled by better data collection and application combined with new digital technologies such as DIS low energy DLT, big data and analytics and AI.

The goal of an enabling sustainable innovation financing ecosystem is to promote financing of new technologies and innovations that are key to emission reductions toward the net zero carbon emissions goals and their widespread adoption. Such an ecosystem will need to go beyond the traditional linear model of innovation through research, development, demonstration and deployment (RDD&D) and adopt a systems approach that is (a) driven by supply-push and demand-pull activities shaped by governments, the private sector and civil society; (b) supported by knowledge management ensuring that new innovations benefit the users and lead to development of new products; and (c) enabled by socio-political support for new technologies and solutions to promote adoption by users and decision makers.[7] A systemic approach requires coordinating innovation efforts of key actors through their engagement in the formulation of well-defined objectives and identification of policy levers. [*See Figure 1*.]

Collaboration between government and private sector with support from MFIs, playing complementary roles, can help provide an enabling ecosystem for financing of sustainable innovation.

- Government's role is to develop and implement robust and credible just transition plans, provide public resources to crowd-in private sector financing and facilitate the private sector's contributions through regulation, policy, encouragement of voluntary efforts at corporate social responsibility, IPR enforcement and supportive international agreements.
- MFIs can provide concessional capital to help leverage private sector funding and capacity building support and technical assistance to help governments and regulators adopt and implement policies and regulations based on internationally accepted principles (e.g., the OECD principles on blended finance) and best practices.

[7] United Nations, Theme Report on Innovation, Technology and Data: Towards the Achievements of SDG 7 and Net-Zero Emissions, 2021 https://www.un.org/sites/un2.un.org/files/2021-twg_4-exesummarie-061721.pdf

- The private sector can provide commercial funding in alignment with economies' strategies, provide useful feedback to help improve the effectiveness of policies and regulations, and voluntary support through the engagement of philanthropies and socially responsible investors.

Figure 1: Innovation Policy Levers

Enhancing innovation supply	Enhancing supply and demand	Enhancing innovation demand	Facilitating knowledge management	Fostering socio-political support
Direct investment in R&D	Pre-commercial procurement	Private demand for innovation	Intellectual property regime	Consultations with industry, civil society and other stakeholders
Fiscal incentives for R&D	Innovation-inducement prizes	Public and private procurement policies	Open access publication requirements	Opinion surveys
Training and skills	Standards	Behavioral insights	International cooperation	Transparent innovation policy processes
Cluster policy	Regulation			
Innovation network policies	Technology foresight			
Policies to support collaboration				

Source: United Nations, *Theme Report on Innovation, Technology and Data: Towards the Achievements of SDG 7 and Net-Zero Emissions*, 2021, based on J. Edler and J. Fagerberg, "Innovation Policy: What, Why and How," *Oxford Review of Economic Policy* (2017) 33(1): 2-23; and International Energy Agency, *Energy Technology Perspectives 2020 – Special Report on Clean Energy Innovation* (Paris, 2020).

Carbon markets can play a significant role in financing sustainable innovation. Robust mechanisms incorporating digital technologies and data science to ensure transparency and verification are important pre-requisites for the successful development of and trust in these markets. These will need to address concerns about fraudulent and improper use of carbon credits. Given the multiplicity of projects, complexity of the market and challenges in identifying and choosing high-quality projects that meet requirements, there has to be clear norms setting the qualifications for buyers and sellers of carbon credits in order to enable scaling of finance, while accepting a certain level of uncertainty that is a normal feature of a rapidly evolving market.

Micro-, small and medium enterprises (MSMEs), where innovations typically originate, need to be provided with a supportive enabling environment. A key objective would be how to bring to the value chain those services in the MSME space that are best in class. Holistic approaches that enable and encourage MSMEs to partner with larger players including global companies in the entire value chain can help achieve scale, replication and impact. Key challenges for MSMEs have been the cost of third party verification and the ability to reach potential customers. Currently, some banks are playing a role in financing verification costs for their MSME clients, as well as in leveraging their huge customer data bases in collaboration with standard setters to provide useful information to both large and small clients. MFIs like the IFC, which has a large network of partner banks and a mechanism for helping in project identification, can play an important role in this process, particularly if they can also provide solutions to project verification for MSMEs.

Providing the market with strong and clear signals from regulators and government and clear pathways are important for the scaling up of young businesses and attracting innovative talent. There is a great need to address the lack of clarity about benefits, given the wide variety of funding, skill sets and technology adoption that currently characterizes the market. In this context, providing incentives for aligning financing with ESG ratings, including through regulation and reducing the cost of capital in funding good projects, in conjunction with clear science-based technology transition roadmaps with a robust mechanism for third party review, assurance and verification where appropriate, can be helpful.[8] This can help financial and similar institutions decide whether a company's strategies and efforts toward decarbonization are eligible for transition finance when they are approached for funding.

Leveraging Intellectual Property to Finance Sustainable Innovation

Economies' intellectual property (IP) regimes have significant potential to facilitate the financing of innovation projects by companies and start-ups that can help accelerate the transition to net zero in the region. IP is a movable asset that companies have used as collateral to obtain financing where the legal, regulatory and business environment is favorable for such secured transactions, either by pledging them or transferring rights to cash flows derived from these assets, or using IP to provide an indicator of the firm's value and support financing decisions. At a time when intangible assets have overtaken tangible assets in terms of driving the economy (the total value of intangible assets globally is estimated at USD65 trillion, as of 2021), this holds particularly great promise for companies where the bulk of their value flows from their IP.[9]

Critical to effectively harnessing IP for developing the technologies facilitating transition is a sufficient understanding of key issues related to IP ownership, licensing and the scope of flexibility of rights and obligation, as well as of infringement risks (in particular infringement of third party IP that could lead to project disruption) and their mitigation. In this context, there is a current increasing trend in protection of technology through trade secrets and patents, as in the case of the electric vehicle industry, where trade secrets and patents for batteries, motors, charging infrastructure and testing equipment are seen as central to technology protection.[10] The use of IP has been instrumental in some of the region's companies' successful efforts in dominating the lithium-ion battery space, as well as the rapidly growing sodium batteries industry.

However, IP-backed financing, while starting to grow, is still very much at a nascent stage, as there is yet no commonly accepted global standard for valuing and financing IP assets. IP financing and valuation is multi-dimensional, where each economy is dealing with complexities related to domestically-oriented and underdeveloped IP ecosystem, judicial ecosystems that lack IP and technological experience and

[8] Japan's Basic Guidelines on Climate Transition Finance provides an example of industry technology transition roadmaps in great detail. Basic Guidelines on Climate Transition Finance (Financial Services Agency; Ministry of Economy,Trade and Industry; and Ministry of the Environment, Japan, May 2021) [https://cdn.climatepolicyradar.org/navigator/JPN/2021/basic-guidelines-on-climate-transition-finance_414e129d48e74f5c6b9c64be653800e9.pdf]

[9] WIPO Director General Daren Tang in a speech cited recent notable IP financing transactions. The first was the IP-backed financing deals facilitated by multinational insurer Aon that enabled agriculture technology firm Indigo to access USD100 million and entrinsic bioscience to raise close to USD50 million in new capital. The second was the launch in Canada by BDC Capital of a new fund aimed at businesses with large IP portfolios and the completion of its first deal making an investment in Vancouver-based robotic firm Novarc Technologies. *IP Backed Financing: Sharing of the Singapore Country Report – The Role of IP Assets in Strengthening Business Access to Finance*, 26 August 2021 [https://www.wipo.int/export/sites/www/about-wipo/en/dg_tang/docs/ip_backed_finance_20210826.pdf]

[10] Panagiota Dafniotis, *The green side of intellectual property and its role in energy transition innovation*, Dentons Insights, 15 June 2022 [https://www.dentons.com/en/insights/articles/2022/june/15/the-green-side-of-intellectual-property-and-its-role-in-energy-transition-innovation]

expertise, enforcement and penalty gaps, legacy IP practices and uncertainties arising from the application of the fundamental patent law concept of prior art (which deals with whether an invention meets the novelty and non-obviousness criteria for patentability).

Leveraging on IP to finance sustainable innovation entails a process of coordination among different stakeholders - including domestic authorities, multilateral development agencies, international professional organizations, civil society, and businesses. Coordination is also key to ensuring that different areas of the law - notably IP law, secured transactions law, and financial regulation - results in synergistic interactions devoid of conflict that protect inventors and investors alike.

From a legal standpoint, different forms of IP financing give rise to what has been labelled as "Commercial Law Intersection" (CLI), that is an overlap between one or more commercial law branches supporting a transaction or a corporate action.[11] For instance, a transaction in which a bank extends a loan to a company and simultaneously takes a security interest in IP, gives rise to a CLI between secured transactions law, IP law, and the legal regimes regulating banking activities. In various legal systems, however, it might not be clear whether a security interest over registered IP (such as copyright) can be perfected following relevant IP law (and prior user rights) or rather secured transactions law rules. Moreover, under banking regulation, IP assets may not be considered as eligible collateral, thus requiring banks to treat the loan as unsecured – a problem encountered in the context of transactions secured with various movable assets commonly available to MSMEs.[12]

In addition to the need of establishing a sound legal framework, valuation standards play a critical role in enabling wider IP financing, both in domestic and cross-border contexts (such as for example when an entity in one jurisdiction is financing a project in another that invests in a third to accelerate the construction of green infrastructure). Facilitating IP financing requires clear title of ownership or IPR, trusted high-quality valuation standards and a well-developed valuation profession domestically, and international consistency of these standards in the cross-border context.

The principles-based International Valuation Standards (IVS) provide a framework that can be adopted to develop domestic valuation frameworks and achieve cross-border consistency. These standards have been developed by the International Valuation Standards Council (IVSC) in collaboration with other standard setters, regulators, valuation professional organizations, valuation service providers and valuation end-users. Adoption of the standards in each jurisdiction can be done pragmatically at the legislative, regulatory or administrative level. It can concern any or all relevant areas such as financial reporting, IP law, corporate rules and stock exchange regulations, tax laws and/or civil law.

In addition, a robust valuation profession can be fostered through the establishment of valuation professional organizations (VPOs) that can (a) establish and promulgate local valuation rules that are more granular but consistent with IVS principles; (b) accredit or license corporate valuation entities; (c) accredit individual valuers based on robust criteria; and (d) provide educational services and outreach programs for valuation professionals, as applicable in each economy. VPOs can play an important role in promoting cross-border IP financing through promotion of mutual recognition of valuers and valuation across economies.

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[11] Giuiliano Castellano and Andrea Tosato, "Commercial Law Intersections" (April 28, 2021). *Hastings Law Journal*, Vol. 72, 2021, University of Pennsylvania Institute for Law and Economics Research Paper No. 20-31, University of Hong Kong Faculty of Law Research Paper No. 2020/018 [https://ssrn.com/abstract=3558378]

[12] Giuliano Castellano and Marek Dubovec (2018). "Credit Creation: Reconciling Legal and Regulatory Incentives" Law and Contemporary Problems, Vol. 81(1), 63. [https://ssrn.com/abstract=3069594]

To address coordination issues and unlock the potential of IP financing for sustainable innovation and intangible assets, a policy strategy is required. The need for a policy strategy that carefully balances the objectives each branch of the law composing a CLI to establish a conducive legal environment has been widely recognized. To this end, legal scholarship emphasized the need to ensure "legal coherence" by devising a method for law reformers and interpreters (such as courts and regulatory authorities) that ensures a synergistic interaction within CLIs, such as those stemming from IP law, secured transactions law and financial regulation.[13] Drawing from this insight, law reformers have developed a blueprint detailing the key elements of a reform strategy that can be implemented domestically when legal change for economic development is sought.[14]

More recently, the strategy has been further developed to advance reforms aimed at creating a cohesive legal and regulatory environment for receivables (and intangibles) finance.[15] APEC can provide a platform for enacting a policy strategy to promote legal and regulatory reforms that can enable expanded IP financing as medium- to long-term objectives under its Enhanced APEC Agenda for Structural Reform (EAASR). However, APEC can also aim to achieve tangible progress responding to the urgency of the need for sustainable innovation through a strategy that is tailored to local needs and understanding regulation as a core component in fostering IP financing of sustainable innovation projects.

To this end, and based on consolidated international experience, the recommended strategy is based on a product-focused approach to identify whether any legal and/or regulatory change is needed and, if so, it elicits the type of change to be performed. This could involve the following steps:

- Establishment of a pilot program, whereby selected financial institutions develop specific IP-based products to support innovation for sustainability. This pilot program could be operationalized through the following activities:
    - A comparative analysis to assess the business viability as well as the legal, regulatory and valuation framework for IP finance. The sampled economies should comprise one or two international financial centers in the region that can provide a benchmark and several developing member economies, selected on the basis of the type of legal system, economic needs, and current innovation policies.
    - Identification of a set of products that can support sustainable innovation through IP financing. These may include IP-backed loans, securitization, and platform-based financing mechanisms to support grass-root financing of innovations.
    - Determination of a pilot criteria, economy and products. The comparative analysis and the product identification converge into a matrix that identifies which products are better suited to each economy and what reforms, if any, would be needed to promote sustainable innovation through IP financing.
- Execution of the pilot program. Based on the analysis, financial institutions and MSMEs are selected in different participating jurisdictions. In this phase, coordination with domestic policymakers (such as government bodies, central banks and regulators) is key to ensuring that the pilot is executed in a protected environment where data can be gathered.

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[13] Castellano and Tosato above (n. 10) at 1047.

[14] International Finance Corporation. 2020. Coordinating Prudential Regulation and Secured Transactions Frameworks: A Primer. © International Finance Corporation, Washington, DC.[http://hdl.handle.net/10986/34813]

[15] European Bank for Reconstruction and Development (2023). New Finance Support – Receivables Finance for MSME Resilience and Economic Growth (EBRD, London) [https://www.ebrd.com/what-we-do/sectors/legal-reform/access-to-finance.html]

- Performance of a product-based diagnostic for each of the participating jurisdictions to assess gaps and opportunities in the legal and regulatory environment. The analysis should also map alignment with international standards and best practices, in respect to law, regulation, valuation standards, business practices, and market development.

Conclusion

Achieving the net zero goals to limit global warming to 1.5 degrees Celsius by 2050 will require a rapid reduction of carbon emissions, which at present remain at unsustainably high levels. Transitioning from the current situation to reach these goals, however, will require faster innovation. In addition to innovations in technologies for developing commercially viable clean energy sources and innovations across hard-to-abate sectors, innovations in the use of digital technology and finance will also be needed. These innovations will be important for lowering the costs and accelerating the transition toward a green future, especially for Asia-Pacific developing economies and for micro-, small and medium enterprises (MSMEs).

For the region to accelerate the achievement of the net zero goals, economies need to develop enabling ecosystems for financing innovations. Such an ecosystem will need to adopt a systems approach that requires coordination of key actors through their engagement in formulating well-defined objectives and identification of policy levers. Most critical would be the collaboration among governments, the private sector and MFIs, the development of robust carbon markets, and a holistic approach to enabling MSMEs to effectively participate in global value chains and bring innovations to the market. Strong and clear signals from regulators and governments and clear transition pathways can facilitate the flow of transition finance to sustainable innovations.

Economies' intellectual property (IP) regimes have significant potential to facilitate the financing of innovation projects by companies and start-ups that can help accelerate the transition to net zero in the region. IP financing is growing, but is still very much at a nascent stage, as there is yet no commonly accepted global standard for valuing and financing IP assets. Leveraging on IP to finance sustainable innovation entails a process of coordination among key stakeholders such as international organizations and experts in the fields of intellectual property, law, regulation and valuation to address this challenge.

APEC can promote the financing of sustainable innovation by providing a platform for:

- Collaboration among relevant government agencies, regulators and the private sector in member economies and multilateral financing institutions to develop consistent, comparable and clear science-based sectoral technology transition roadmaps with robust mechanisms for third party review, assurance and verification for each economy and blended financing mechanisms that can crowd in private sector financing for sustainable innovation projects and promote innovative MSMEs' access to funding.
- Promotion of legal and regulatory reform to promote IP financing and IPR ownership under the Enhanced APEC Agenda for Structural Reform (EAASR).
- Initiation, in collaboration with relevant international stakeholders and the private sector, of a pilot involving one or two international financial centers in the region and several developing member economies to develop a reform agenda targeting concrete and tangible results by identifying a set of products (including IP-backed loans, securitization, and platform-based financing mechanisms) that can support sustainable innovation through IP; and performing a product-based diagnostic for each participating jurisdiction to assess gaps and opportunities in the legal and regulatory environment and to map alignment of laws, regulations, valuation standards, business practices, and market development with international standards and best practices.

AGENDA

(*Times displayed are Singapore Time*)

Master of Ceremonies: Mr. Maurice Wee, Coordinator, Asia-Pacific Financial Forum (APFF) Sustainable Finance Development Network (SFDN)

9:00-9:15	**OPENING SESSION** **Welcome Remarks** Ms. Elaine Lam, Executive Vice President and Head of Global Corporate Banking, OCBC Bank **Opening Remarks** Mr. Kobsak Duangdee, Chair, Asia-Pacific Financial Forum (APFF); and Secretary General, Thai Bankers' Association Mr. Nicolas Marquier, Manager for Singapore, Malaysia and Brunei Darussalam, International Finance Corporation
9:15 -10:20	**SESSION 1** **THE LANDSCAPE OF SUSTAINABLE INNOVATION** Moderator: Ms. Ayako Kageyama, Senior Expert, Sustainable Investments, Asia-Pacific, UNDP
	Mr. Timothy Colyer, Partner and Head of Climate and Sustainability, Asia-Pacific, Oliver Wyman Dr. Pushkala Lakshmi Ratan, Senior Climate Finance Specialist for Asia, International Finance Corporation Mr. William Sonneborn, Global Director, Disruptive Technologies and Funds Group (CDF), International Finance Corporation Mr Kum Mun Lock, Deputy Managing Director, Envision Digital International Pte Ltd **Open Discussion**
10:20 -11:10	**SESSION 2** **CREATING AN ENABLING SUSTAINABLE INNOVATION FINANCING ECOSYSTEM** Moderator: Ms. Tamara Singh, Sherpa, APFF SFDN; Founder, W3 CDD; and Strategic Advisor, Official Monetary and Financial Institutions Forum (OMFIF)
	Mr. Benjamin Towell, Executive Director, Global Wholesale Banking Sustainability Office, OCBC Bank Mr. Philip Gyasi Yeboah, Senior Investment Officer, International Finance Corporation Mr. Sam Gill, Co-Founder and President, Sylvera Ms. Pauline Wray, Head of New Ventures, Stealth Startup; and Member of the Board of Advisors, Viridios Capital (TBC) **Open Discussion**
11:10-11:25	***Coffee Break***

11:25 -12:25	**SESSION 3** **LEVERAGING INTELLECTUAL PROPERTY TO FINANCE SUSTAINABLE INNOVATION** Moderator: Mr. Roger Wong, Founding President, Singapore Digital Chamber of Commerce Foundation
	Dr. Giuliano Castellano, Associate Professor of Law, The University of Hong Kong; and Legal Expert/Italian Delegate, UNCITRAL Working Group VI
	Mr. Nicolas Konialidis, Asia Director, International Valuation Standards Council (IVSC) [
	Mr. Johnson Kong, Member, Board of Governors, International IP Commercialization Council
	Mr. Charles Liu, Counsel, Corporate Finance, Addleshaw Goddard
	Open Discussion
12:25-12:30	**CLOSING SESSION** **Way Forward and Closing Remarks** Dr. Julius Caesar Parrenas, Coordinator, Asia-Pacific Financial Forum

The meeting will be recorded to be made available to invited participants.